CLAIMS:

1. A capacitive sensor for mounting to a body, in use, comprising:

a sensor plate configured to have a first signal applied thereto;

first guard plate interposed between the sensor plate and the body, which is configured to have a first guard plate signal applied thereto; and

a second guard plate interposed between the first guard plate and the body which is configured to have a second guard plate signal applied thereto.

2. The capacitive sensor of claim 1 further comprising at least one control means configured to apply the first and second guard plates signals to the first and second guard plates respectively.

3. The capacitive sensor of claim 1 or 2 wherein the first guard plate signal is related to the first signal applied to the sensor plate by a first amplification factor and the second guard plate signal is related to the first signal by a second amplification factor.

4. The capacitive sensor of claim 3 wherein the first and second amplification factors are substantially one.

5. The capacitive sensor of claim 3 wherein the second amplification factor is greater than the first amplification factor.

6. The sensor of any preceding claim wherein the first and second guard plates signals are substantially identical to the first signal applied to the sensor plate in terms of frequency, phase and amplitude.

7. The sensor of any preceding claim further comprising an insulative substrate between the first guard plate and the second guard plate, for electrically isolating the first guard plate from the second guard plate.

8. The sensor according to any preceding claim wherein the first and second guard plates are arranged substantially in parallel.

9. The sensor according to any preceding claim further comprising:

first and second amplifier units,

wherein the first signal applied to the sensor plate is also applied to the first amplifier unit, and wherein

the output of the first amplifier unit is fed to the first guard plate and the second amplifier unit, and wherein

the output of the second amplifier unit is fed to the second guard plate.

10. The sensor according to any one of claims 1 to 8 further comprising:

first and second amplifier units, and wherein

the first signal applied to the sensor plate is fed to the first and second amplifier units, and wherein

the output of the first amplifier unit is fed to the first guard plate and the output of the second amplifier unit is fed to the second guard plate.

11. The sensor of claim 10 further comprising a third amplifier, wherein the first signal is fed to the first and second amplifier units via the third amplifier unit.

12. A capacitive sensor according to claim 9, 10 or 11 wherein each amplifier has a gain of substantially one.

13. A capacitive sensor of any preceding claim further comprising calculation means for providing proximity information based upon the capacitance between the sensor plate and electrical ground.

14. A capacitive sensor according to any preceding claim wherein the first signal is an integrated square wave.

15. A capacitive sensor according to any preceding claim further comprising a casing attachable to the body and for enclosing the sensor plate and the first and second guard plates.

16. A capacitive sensor as claimed in claim 14 wherein the casing further comprises a recess at an upper end and a recess at a lower end, such that, when the sensor is mounted on the body, the recesses are configured to direct liquid flowing down the body to flow generally between the second guard plate and the body upon which the sensor is mounted.

17. A capacitive sensor system comprising:

a signal source arranged to produce a main signal; and

first and second amplifier units,

wherein the main signal is fed to a sensor plate connection and the first amplifier unit, and wherein

the output of the first amplifier unit is fed to a first guard plate connection and the second amplifier unit, and wherein

the output of the second amplifier unit is fed to a second guard plate connection.

18. A capacitive sensor control system for connection to a capacitive sensor comprising a sensor plate, a first guard plate interposed between the sensor plate and the body and a second guard plate interposed between the first guard plate and the body, the control system comprising:

a signal source arranged to produce a main signal; and

first and second amplifier units,

wherein the main signal is fed to the sensor plate and to the first and second amplifier units, and wherein

the output of the first amplifier unit is fed to the first guard plate and the output of the second amplifier unit is fed to the second guard plate.

19. The sensor system of claim 18 further comprising a third amplifier unit, wherein the main signal is fed to the first and second amplifier units via the third amplifier unit.

20. A capacitive sensor system according to claim 17, 18 or 19 wherein each amplifier has a gain of substantially one.

21. A method of operating a capacitive sensor when mounted to a body the capacitive sensor comprising a sensor plate, a first guard plate interposed between the sensor plate and the body and a second guard plate interposed between the first guard plate and the body, the method comprising:

applying a first signal to the sensor plate;

applying a first guard plate signal to the first guard plate;

applying a second guard plate signal to the second guard plate.

22. The method of claim 21 wherein the first guard plate signal is related to the first signal by a first amplification factor and the second guard plate signal is related to the first signal by a second amplification factor.

23. The method of claim 22 wherein the first and second amplification factors are substantially one.

24. The method of claim 21 wherein the first guard plate signal is substantially identical to the first and second guard plate signals in terms of frequency, phase and amplitude.

25. A method for operating a capacitive sensor system, the method comprising:

generating a main signal;

applying the main signal to a sensor plate;

amplifying the main signal;

applying the amplified main signal to a first guard plate;

amplifying the signal applied to the first guard plate; and

applying the amplified signal of the first guard plate to a second guard plate.

26. A method for operating a capacitive sensor system, the method comprising:

generating a main signal;

applying the main signal to a sensor plate;

branching the main signal into first and second signals;

amplifying the signal applied to the sensor plate to produce first and second signals;

applying the first signal to a first guard plate; and

applying the second signal to a second guard plate.

27. The method of claim 26 further comprising amplifying the main signal before branching into first and second signals.

28. The method of claim 25, 26 or 27 wherein the signals are amplified with a unity gain.

29. A capacitive sensor substantially as described herein with reference to Figures 5 to 7.

30. A vehicle comprising a capacitive sensor according to any one of claims 1 to 16 or 29.

31. A capacitive sensor system substantially as herein described with reference to Figures 5 to 7.

32. A method for operating a capacitive sensor system substantially as herein described with reference to Figures 5 to 7.